



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/064,736	08/12/2002	Francis R. Alix	AL.US.12	6591
23731	7590	09/23/2005	EXAMINER	
MESMER & DELEAULT, PLLC 1 NEW HAMPSHIRE AVE. SUITE 125 PORTSMOUTH, NH 03801			LISH, PETER J	
			ART UNIT	PAPER NUMBER
			1754	

DATE MAILED: 09/23/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/064,736

Applicant(s)

ALIX ET AL.

Examiner

Peter J. Lish

Art Unit

1754

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 23 September 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-36 is/are pending in the application.
- 4a) Of the above claim(s) 25-36 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-3 is/are allowed.
- 6) ☒ Claim(s) 4-8, 11-17, 20-24 is/are rejected.
- 7) ☒ Claim(s) 9, 10, 18 and 19 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>9/23/02</u> . | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Election/Restrictions***

Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 1-24, drawn to a method of removing oxides from a gas stream, classified in class 423, subclass 243.11.
- II. Claims 25-36, drawn to an apparatus comprising electrical discharge, classified in class 422, subclass 186.04.

The inventions are distinct, each from the other because of the following reasons:

Inventions I and II are related as process and apparatus for its practice. The inventions are distinct if it can be shown that either: (1) the process as claimed can be practiced by another materially different apparatus or by hand, or (2) the apparatus as claimed can be used to practice another and materially different process. (MPEP § 806.05(e)). In this case the apparatus can be used to practice another and materially different process, such as the sterilization of medical equipment.

Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

During a telephone conversation with Phil Decker on September 7<sup>th</sup>, 2005, a provisional election was made without traverse to prosecute the invention of Group I, claims 1-24.

Affirmation of this election must be made by applicant in replying to this Office action. Claims

Art Unit: 1754

25-36 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 7, 11-16, and 20-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Skelley et al. (US 5,316,737) taken with Dahlstrom et al. (US 3,873,532).

Skelley et al. teaches a process for the removal of sulfur oxides and nitrogen oxides from an exhaust gas. The process comprises oxidizing the gases with ozone to form higher orders of NO<sub>x</sub> and SO<sub>x</sub>, such as for example converting NO to NO<sub>2</sub>. The gases are then sent to a scrubber/absorption chamber where they are contacted with sodium hydroxide. Finally, the gases are sent through a demister to remove any aerosols and released out of the stack. Skelley et al. does not explicitly teach the regeneration of the scrubbing solution.

Dahlstrom et al. however teach a similar process wherein  $\text{SO}_x$  is scrubbed from a gas stream with sodium hydroxide. Dahlstrom teaches that the sodium hydroxide scrubbing solution is contacted with calcium hydroxide in order to regenerate the scrubbing solution. This common process is well known as a dual or double alkali scrubbing process. It would have been obvious to one of ordinary skill at the time of invention to use the regeneration process of Dahlstrom et al. in the process of Skelley et al. in order to regenerate the scrubbing solution and thus cut down on waste.

Regarding claims 11-12 and 20-21, Skelley et al. does not explicitly teach the ratio of  $\text{SO}_2$  to  $\text{NO}_2$  present after oxidation. However, it is expected that the process of Skelley et al. may be performed so as to have different oxidizing potentials, i.e. performing oxidation for different lengths of time, and that the gases treated by the process of Skelley et al. may vary in their  $\text{SO}_x$  to  $\text{NO}_x$  ratios. Therefore, while Skelley et al. does not explicitly teach the gas concentrations after the oxidation reaction, where, as here, the reference discloses all the limitations of a claim except a property or function, and the examiner cannot determine whether or not the reference inherently possesses properties which anticipate or render obvious the claimed invention, the burden of proof is shifted to the applicant, as in *In re Fitzgerald*, 619 F.2d 67, 205 USPQ 594 (CCPA 1980). Furthermore, it is known that exhaust gas may contain a significantly higher amount of sulfur oxides than nitrogen oxides, which would appear to ensure a mole ratio of  $\text{SO}_2$  to  $\text{NO}_2$  of greater than four to one after oxidation.

Regarding the removal of mercury, while Skelley et al. does not specifically teach the removal of mercury, it is known in the art that mercury is present in exhaust gases and because no difference is seen between the process of Skelley et al. and that of the instantly claimed

Art Unit: 1754

invention, it is expected that at least a portion of the mercury present in the exhaust gas of Skelley et al. will be oxidized and removed.

Claims 8 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Skelley et al. taken with Dahlstrom et al. as applied to claims 7 and 16 above, and further in view of Hwang et al. (US 6,136,284).

Skelley et al. does not explicitly teach what type of ozonizer is used to oxidize the sulfur and nitrogen oxides. Hwang et al. teaches a similar process for the removal of these oxides from gas streams. Hwang teaches that the ozonizer may be a corona discharge reactor, which is a type of electrical discharge reactor. It would have been obvious to one of ordinary skill at the time of invention to use the corona discharge ozonizer as the ozonizer in the process of Skelley et al., as it is seen to achieve the desired effect.

Claims 4-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dahlstrom et al. (US 3,873,532) taken with Hasegawa et al. (US 6,203,598), or alternatively over Hasegawa et al. taken with Dahlstrom et al.

Dahlstrom et al. teaches a dual alkali scrubbing treatment of exhaust gases, wherein sulfur oxides are contacted with a sodium hydroxide scrubbing solution and the scrubbing solution is regenerated by contact with calcium hydroxide. Dahlstrom et al. does not explicitly teach the use of a wet electrostatic precipitator. Hasegawa et al. teaches a similar process for the removal of sulfur oxides from a gas stream by scrubbing with sodium hydroxide. Hasegawa et al. also teaches the use of a wet electrostatic precipitator after the absorption. (scrubbing)

Art Unit: 1754

process, in order to collect any dust or powder remaining in the gas. It would have been obvious to one of ordinary skill at the time of invention to use the wet electrostatic precipitator of Hasegawa et al. in the process of Dahlstrom et al. in order to ensure the removal of any dust or powder from the vented gases. Alternatively, it would have been obvious to one of ordinary skill at the time of invention to use the process of Dahlstrom et al. in order to regenerate the scrubbing solution of Hasegawa et al. and thus cut down on waste.

#### ***Allowable Subject Matter***

Claims 9-10 and 18-19 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 1-3 are allowed.

#### ***Conclusion***


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Peter J. Lish whose telephone number is 571-272-1354. The examiner can normally be reached on 9:00-6:00 Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman can be reached on 571-272-1358. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1754

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

PL

  
STANLEY S. SILVERMAN  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 1700